

Claims

I claim:

1. An electric heater, particularly as an auxiliary heating means for automotive vehicles, comprising a housing which is made open on the elongate housing faces, and a layered structure consisting of at least one PTC heating element, a radiator element, contact sheets for power supply and a resilient element,
5 the layered structure being kept clamped in the housing by the resilient element,
wherein an opening is provided laterally in the housing for inserting the resilient element.
2. The electric heater according to claim 1, wherein a resilient channel is formed in the housing for receiving the resilient element.
3. The electric heater according to claim 1 further comprising positioning means for pre-fixing the elements of the heater in the housing.
4. The electric heater according to claim 3, wherein the positioning means in the housing simultaneously form a groove for guiding the resilient element during insertion.
5. The electric heater according to claim 1, wherein the elongate faces of the housing are mechanically reinforced by at least one transverse strut.
6. The electric heater according to claim 5, wherein the struts in the elongate faces of the housing have the shape of a grid structure.
7. The electric heater according to claim 5, wherein the grid structure has at least one longitudinal strut in the area of the PTC heating elements.

8. The electric heater according to claim 1, wherein said housing is made from plastics.
9. The electric heater according to claim 1, wherein the housing comprises positioning means for keeping the PTC heating elements mutually spaced apart.
10. The electric heater according to claim 1, wherein the housing comprises two half-shells.
11. The electric heater according to claim 10, wherein the half-shells of the housing can be put together.
12. The electric heater according to claim 11, further comprising locking pins or locking noses which, when the half-shells of the housing are put together, effect a locking of the two half-shells.
13. The electric heater according to claim 10, wherein the half-shells are configured such that they separate the housing approximately in the middle between the elongate faces of the housing.
14. The electric heater according to claim 13, further comprising respectively opposite projections provided on the separation line of the half-shells which will engage each other when the half-shells are assembled.
15. The electric heater according to claim 1, wherein the resilient element consists of a sheet member with resilient segments projecting therefrom.

16. The electric heater according to claim 1, wherein the resilient element is configured such that it transmits the clamping forces essentially onto the reinforced longitudinal sides of the housing.
17. The electric heater according to claim 15, wherein the resilient element consists of a sheet member with resilient segments projecting therefrom.
18. The electric heater according to claim 17, wherein each of the resilient segments extends into the edge portions of the longitudinal sides of the resilient member.
19. The electric heater according to claim 18, wherein the resilient member is made integral with the resilient segments.
20. The electric heater according to claim 15, wherein at least one resilient segment for generating clamping forces is provided at each PTC heating element position for a frictional clamping action.
21. The electric heater according to claim 20, wherein at least two resilient segments are provided for each PTC heating element position.
22. The electric heater according to claim 1, further comprising at least one seal for sealing longitudinal struts relative to the PTC heating elements.
23. The electric heater according to claim 22, wherein the seal seals the whole grid structure.
24. The electric heater according to claim 23, wherein the seal for a housing side is respectively made integral.

25. A housing for an electric heater, particularly as an auxiliary heating means for automotive vehicles, for receiving a layered structure consisting of at least one PTC heating element, a radiator element, contact sheets for power supply and a resilient element, the housing having a lateral opening for insertion of the resilient element.
26. The housing according to claim 25, wherein a resilient channel is formed in the housing for inserting the resilient element.
27. The housing according to claim 25, further comprising positioning means in the housing for pre-fixing the elements of the heater.
28. The housing according to claim 27, wherein the positioning means in the housing form a groove for guiding the resilient element at the same time.
29. The housing according to claim 25, wherein the elongate faces of the housing are mechanically reinforced by at least one transverse strut.
30. The housing according to claim 29, wherein the struts in the elongate faces of the housing having an open configuration are in the form of a grid structure.
31. The housing according to claim 25, wherein the housing is made from plastics.
32. A method for producing an electric heater, particularly as an auxiliary heating means for automotive vehicles, comprising a housing consisting of two half-shells and made open on the elongate faces of the housing, and a layered structure consisting of at least one PTC heating element , a radiator element , contact sheets for power supply and a resilient element , the layered structure being kept clamped by the resilient element in the housing , with the following mounting steps:

inserting the contact sheets, the radiator element, and the PTC heating element into a first half-shell of the housing,

attaching the second half-shell of the housing to the first half-shell, and

5 inserting the resilient element through an opening of the assembled housing to effect a clamping of the layered structure.

33. An auxiliary electric heater for an automotive vehicle, the electric heater comprising:

an open housing having elongate housing faces; and

5 a layered structure including of at least one PTC heating element, a radiator element, contact sheets for power supply, and a resilient element, the layered structure being clamped in the housing by the resilient element, wherein an opening is provided laterally in the housing for inserting the resilient element.

34. The electric heater according to claim 33, wherein a resilient channel is formed in the housing for receiving the resilient element.

35. The electric heater according to claim 33, further comprising positioning means for pre-fixing the elements of the heater in the housing.

36. The electric heater according to claim 33, wherein the elongate faces of the housing are mechanically reinforced by at least one transverse strut.

37. The electric heater according to claim 33, wherein the housing comprises positioning means for keeping the PTC heating elements mutually spaced apart.

38. The electric heater according to claim 33, wherein the housing comprises two half-shells.
39. The electric heater according to claim 33, wherein the resilient element comprises a sheet member with resilient segments projecting therefrom.
40. The electric heater according to claim 33, wherein the resilient element is configured such that it transmits the clamping forces essentially onto reinforced longitudinal sides of the housing.
41. The electric heater according to claim 40, wherein the sides of the housing are reinforced by longitudinal struts, and further comprising at least one seal for sealing the longitudinal struts relative to the PTC heating elements.
42. A method for producing an auxiliary electric heater for an automotive vehicle, the electric heater comprising a housing formed from first and second half-shells and made open on elongate faces thereof, and a layered structure including at least one PTC heating element, a radiator element, contact sheets for power supply, and a resilient element, the method comprising:
- inserting the contact sheets, the radiator element, and the PTC heating element into the first half-shell of the housing,
- attaching the second half-shell of the housing to the first half-shell, and
- Inserting the resilient element through an opening of the assembled housing to effect a clamping of the layered structure in the housing.